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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Paper No. 14

Application Number: 09/723,123
Filing Date: November 27, 2000
Appellant(s): ACHARYA ET AL.

MAILED

APR 13 2004

Technology Center 2600

Senjeev K. Singh, Reg. No. 28,994
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed March 12, 2004.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

No amendment after final has been filed.

(5) Summary of Invention

The summary of invention contained in the brief is correct.

(6) Issues

The appellant's statement of the issues in the brief is correct.

(7) Grouping of Claims

The rejection of claims 1-15 stand or fall together because appellant's brief does not include a statement that this grouping of claims does not stand or fall together and reasons in support thereof. See 37 CFR 1.192(c)(7).

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

6,157,746	Sodagar et al.	12-2000
6,125,201	Zador	9-2000
5,777,678	Ogata et al.	7-1998

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent. The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 1, 4, 6-7, 10, and 12-15 are rejected under 35 U.S.C. § 102(e) as being anticipated by Zador, 6,125,201.

For claim 1, providing error data that indicate motion in an image is provided by Zador in at least the paragraph bridging cols. 14-15, and the fourth full paragraph in c. 28, with reference to inter-frame compression for motion coding of "delta" frames indicating change between frames provides for the synonymous "error" data.

Representing error data as a collection of ordered bits, coding the bits of each order to indicate zerotree roots associated with the order, and in a single pass, embedded zerotree coding of the wavelet transform error image while encoding

insignificant wavelet coefficients in the course of initial passes is provided by Zador in at least c. 7, line 31- c. 7, line 63, the paragraph bridging cols. 22-23, the first two full paragraphs in c. 23, fourth full paragraph in c. 24, where the error data is ordered based on at least color and/or luminance, bit depth, and magnitude, and zerotrees are indicated based on this order, where the wavelet zerotree data is insignificant, and is explicitly provided in a single pass, and coding is provided also by entropy coding in at least c. 14, lines 54-60.

Performing wavelet transformations on the image with error data to provide wavelet coefficients for a wavelet transformed error image is provided by Zador in the fourth full paragraph in c. 28, where the image data can be interframe data between frames providing for delta or error frame data, which can be wavelet transformed by Zador in at least col. 8, lines 60-65, c. 13, lines 21-24, c. 14, lines 30-32, and the paragraph bridging cols. 14-15, where again, the data can be error data from motion video, i.e. interframe.

For claims 4 and 10, wherein providing error data includes taking the difference between two successive image representations in an image sequence is provided by the delta (i.e. difference) interframe data of Zador in at least the paragraph bridging cols. 14-15 and the fourth full paragraph in c. 28.

For claims 6, 12, and 15, including coding the bits based on whether or not the data exceeds a predetermined threshold value is provided by Zador in at least c. 4, lines

56-63.

For claims 7 and 14, see the rejection of at least claim 1.

For claim 13, see the rejection of at least claims 1 and 4, where Zador clearly also provides for a system, and further explicitly recites "system" in at least the paragraph bridging cols. 6-7.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.
>
> This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 2-3 and 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zador, 6,125,201, as applied to claims above, in view of Sodagar et al., 6,157,746.

For claims 2 and 8, determining which of the bits indicate zeros and classifying each zero as either an isolated zero or a zerotree root is not explicitly provided by Zador, but is part of conventional zerotree coding, so that it is at least suggested by

Zador. In any case, determining which of the bits indicate zeros and classifying each zero as either an isolated zero or a zerotree root is provided by conventional and well known zerotree coding by Sodagar in at least the third full paragraph in c. 2 and first full paragraph in c. 8, for example. It would've been obvious to one having ordinary skill in the art at the time the invention was made that Zador can provide for isolated zeros, and which bits indicate them, since Zador already provide for zerotree coding, and Sodagar explicitly recites an isolated zero as one of the classifications, and further can be used by Zador, since Sodagar provides for, inter alia, isolated zero(s) to efficiently encode the significance map.

For claims 3 and 9, wherein some of the error data are descendants of some of the other error data is clearly indicated where cited above, which is merely the basic hierarchical relationship of wavelet and zerotree coding, where descendants (or "children") is taught throughout Zador and at least where cited above.

Determining zeros by traversing a descendant tree from a bit associated with one of the some of the error data to bits associated with the other error data to locate zerotree roots is provided by Zador such as, for example, where cited above with respect to the teaching of zerotree roots by Zador, where zerotree roots are located by determining the descendants of the zerotree root and the zerotree root as zero.

Claims 5 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zador, 6,125,201, as applied to claims above, in view of Ogata et al., 5,777,678.

For claims 5 and 11, wherein the taking the difference includes taking the difference of two successive discrete wavelet transform coded frames is not explicitly provided by Zador, but is conventional and well known and is provided by Ogata in at least Fig. 2A, and the fifth full paragraph in c. 7. It would've been obvious to one having ordinary skill in the art at the time the invention was made to take the difference based on successive discrete wavelet transform coded frames, since both use the wavelet transform in video compression, and because the wavelet transform of Ogata does not deteriorate the video image.

(11) Response to Argument

The Appellant argues on pages 10-11 of the Appeal Brief that "[t]here is not teaching whatsoever as to performing wavelet transformations on the image with error data" and that "[n]owhere does the Zador reference performs wavelet transformations on the image with error data to provide wavelet coefficients for a wavelet transformed error image".

The Examiner respectfully disagrees. One of ordinary skill readily understands that motion interframe coding is the coding of "error data that indicate motion in an image" (claim 1, line 2). As noted in the rejection of claim 1, see the paragraph bridging cols. 14-15 and the fourth full paragraph in c. 28 of Zador, and compare this with the Appeal Brief in the second full paragraph on page 6 (which is actually an excerpt from the last full paragraph on page 11 of the specification). Appellant uses the word "error" as is well known in the art; Zador uses the word "delta" as is also well

known in the art, and both words are synonymous in the context of motion image (i.e. video) interframe coding. However, even without the words "error" or "delta", motion interframe coding is the coding of the difference between images, where this difference uses terms such as "error" or "delta". Thus, Zador clearly anticipates the concept of "providing error data that indicate motion in an image" – claim 1, line 2.

The Appellant argues on pages 11-12 of the Appeal Brief that Zador does not teach using a single pass zerotree to encode insignificant wavelet coefficients in the course of initial passes, but rather that Zador teaches a single pass zerotree technique without coding insignificant wavelet coefficients.

The Examiner respectfully disagrees. First, Zador explicitly teaches a single pass zerotree technique in the fourth full paragraph in c. 24. This single pass zerotree of Zador uses dominant and subordinate initial passes in the determination of the zerotree, the zerotree corresponding to insignificant data. See, for example, c. 23, lines 9-12, and the first full paragraph in c. 23, where it should be clear that zero values and zerotree roots represent zeros or insignificant data. Secondly, this is considered also provided by Zador by encoding a single bitplane at a time using initial dominant and subordinate passes, where embedding zerotree coding is performed with a single pass – Zador, last full paragraph in c. 21, and c. 23, line 8 – 32.

The Appellant argues on pages 12-13 of the Appeal Brief that Zador does not provide for representing error data as a collection of ordered bits nor for coding the bits

or each order to indicate zerotree roots associated with the order.

The Examiner respectfully disagrees. Bitplane order at least is very clearly taught by Zador with respect to zerotree coding – third full paragraph in c. 22, third full paragraph in c. 23, and the fourth full paragraph in c. 24. Color plane order is also provided by Zador in at least the fourth full paragraph in c. 21.

The Appellant argues on pages 13-14 of the Appeal Brief that neither Zador nor Sodagar provide for determining which bits indicate zeros to classify each zero as either an isolated zero or a zerotree root.

The Examiner respectfully disagrees. First, determining which bits indicate zeros is clearly understood to be provided by Zador, since Zador provide for determining significance including significance for zerotrees, and therefore zeros, from each bitplane which corresponds to bits in an image. See Zador in at least c. 23, lines 8-32, and c. 24, lines 9 – 43, which clearly indicates which bitplanes or bits indicate zeros. Classifying zerotree roots is clearly provided by Zador as noted above in the first full paragraph in c. 23, but Zador does not provide for the well known isolated zero symbol as is well known in zerotree coding. Isolated zeros as used in conventional zerotree coding is explicitly provided by Sodagar, and in Sodagar, there are only two types of zeros, zerotree roots or isolated zeros, so that the zeros are classified as either zerotree roots or isolated zeros.

The Appellant argues on pages 14-15 of the Appeal Brief that Zador does not teach taking the difference of two successive discrete wavelet transformed coded frames.

The Examiner respectfully disagrees. Zador already clearly provide for wavelet transformation in image coding, and Zador also clearly teach that such coding can include the coding of video (i.e. motion images), which is conventionally done by interframe coding, i.e. the difference between frames. Zador merely do not explicitly provide the conventionality of a difference between two wavelet transformed frames. It is known in the art to take the difference of an input image and a wavelet transform decoded image or to take the difference between images that are already transformed. Zador is merely silent with respect to which, but either is conventional and well known. One merely turn to Fig. 2A where it is clearly shown how the frame difference between two successive discrete wavelet transformed video images are calculated by element 90. Such a combination with Zador is proper, since the zerotree coding is performed on wavelet transformed coefficients regardless of when the difference is taken, and there is no teaching in Zador that the difference of Ogata cannot be used with Zador.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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April 8, 2004

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